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ABSTRACT

As part of its first-year activities, the Atlanta University Department of Chemistry, which started as Doctor of Arts degree program in September 1975, sponsored a conference on April 23-24, 1976 to which were invited 20 two- and four-year college faculty and administrators. The main objectives were to discuss the need and credibility of the Doctor of Arts degree, to provide information on the degree to the targeted academic community, and to solicit input from knowledgeable persons on the academic preparation appropriate for a person planning to teach in an undergraduate institution. This report is primarily a summary of the two major conference speeches and the discussions and recommendations of three intensive working sessions. Dr. E. Alden Dunham opened the conference with a review of the need for, the content, and the historical development of the degree. Dr. Paul L. Dressel closed with a summary of what a good program should be moving towards, based on his continuing review of existing D. A. programs. (LBH)

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Conference on the Doctor of Arts Degree Program in Chemistry

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Atlanta University
April 23 - 24, 1976

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INTRODUCTION

After two years of research and planning, the Atlanta University Department of Chemistry started a Doctor of Arts degree program in September, 1975, placing it among nine graduate chemistry departments offering the degree as of January, 1976. The D.A. degree is directed toward the development of broadly trained chemists whose primary interest and creative efforts will be in undergraduate teaching in community or four-year colleges. By focusing its doctoral efforts on this degree, the department felt it could play a particularly significant part in chemical education and the development of minority chemists as appropriate to its historical role as one of the very few minority institution graduate chemistry departments in the country.

Program initiation was greatly helped by a three-year grant from the National Science Foundation's Alternatives in Higher Education program plus several student support grants from private foundations. Five students are now in the program and the number of qualified applicants continues to increase as the existence of the program becomes better known. Close ties with the undergraduate colleges comprising the Atlanta University Center and with Atlanta Junior College have been established. In short, there is a viable beginning.

As part of the first year activities, the department sponsored a conference on April 23-24, 1976 to which were invited about twenty two- and four-year college faculty and administrators as listed below. The main objectives of the conference were to discuss the need and credibility of the Doctor of Arts degree, to provide information on the degree to the targeted academic community, and to solicit input from knowledgeable persons on the academic preparation appropriate for a person planning to teach in an undergraduate institution. This report is primarily a summary of the two major conference speeches and the discussions and recommendations of three intensive working sessions. Conference participants were provided with background materials as listed in the Appendix. Dr. E. Alden Dunham, who led in the Carnegie Foundation's decisive influence and support of the development of Doctor of Arts programs in the early seventies, opened the conference with a review of the need for, the content, and the historical development of the degree. Dr. Paul L. Dressel, co-author of the two most comprehensive monographs on the D.A. degree, closed the conference with a summary of what a good program should be moving towards based on his continuing review of existing D.A. programs. Conference participants were divided into two interest groups - a community college group and a four-year college group - each of which took part in three working sessions. Although the focus of the two groups differed, discussion in each was vigorous and informative both to the department and to the participants involved.

Introduction (continued)

The department wishes to acknowledge with appreciation the essential help of the auxiliary staff of the department, Mr. Leon Henry and Ms. Claudia Huff, the cooperation of the Atlanta University administration, and the real work accomplished by the conference participants.

AGENDA

Morning Session - April 23, 1976
Room 202, Wright Hall, Atlanta University
Alfred F. Young, Presiding

9:00	Welcome	Dr. Earle D. Clowney Acting Dean, School of Arts and Sciences
9:30	Overview of the D.A. Program at A.U. and Introduction of Speaker	Dr. Thomas W. Cole, Jr. Chairman, Department of Chemistry
9:45 - 10:30	General Topic: The History of and Impetus for the Doctor of Arts Degree	Dr. E. Alden Dunham Carnegie Corporation of New York
10:30 - 10:45	Coffee Break	
10:45 - 12:30	Discussion Groups	
	1. Junior and Community Colleges	Frank E. Cummings
	2. Four Year Colleges	Alfred F. Young
12:30 - 2:00	Lunch	Paschal's Motor Hotel

Afternoon Session - April 23, 1976
Paschal's Motor Hotel

2:00 - 3:00	Discussion Groups	
	1. Junior and Community Colleges	Room 101
	2. Four Year Colleges	Room 102
3:30 - 3:45	Coffee Break	
3:45 - 5:00	Discussion Groups Continued	Rooms 101 and 102

Evening Session - April 23, 1976
Paschal's Motor Hotel

5:30 - 7:00	Mixer	Matador Room
7:00 - 9:00	Banquet	Matador Room
	1. Welcome	Dr. Thomas D. Jarrett President, Atlanta University

Agenda (continued)

	2. Presenter	Dr. William E. Moore Institute for Services to Education
	3. Presenter	Dr. McDougald Monroe Dean, Atlanta Junior College

Morning Session - April 24, 1976
Paschal's Motor Hotel, Matador Room
Alfred F. Young, Presiding

9:00	Introduction of Speaker	Frank Cummings
9:15 - 10:15	General Topic: Current D.A. Programs - Strengths and Weaknesses	Dr. Paul L. Dressel Michigan State University
10:15 - 10:30	Coffee Break	
10:30 - 12:00	Summary and Finalization of Conference Proceedings	Frank Cummings
12:00	Adjournment	

SUMMARY OF SPEECH BY DR. E. ALDEN DUNHAM

Why the D.A. degree? In view of the shift taking place toward mass higher education, the Ph.D. degree is becoming inappropriate for most college teaching jobs. Many problems in higher education relate back to the inappropriateness of the Ph.D., which is virtuous as regards research and yet weak in relation to training for teaching. Approximately 90% of all Ph.D.'s do not perform any research beyond the dissertation, yet this research is the strength of their degree and further research is the objective of their training. In addition, approximately half of all Ph.D.'s go into academia, though this figure varies greatly by discipline. Thus the D.A. degree is offered as a positive alternative to the Ph.D.

The ideal D.A. is not an Education degree but an Arts and Sciences degree. It has four major components. The first is a broadly conceived disciplinary component. The second component, which consists of education courses, is very controversial. But D.A. degree recipients should know something about learning theory and educational psychology. D.A.'s should be familiar with educational philosophy, faculty organization and governance, and academic ethics and have evolved positions on the key issues. They should know something of the history of higher education in the United States. D.A.'s should be well versed in the current technology designed to aid teaching, especially computers. In addition, D.A.'s should receive training in curriculum planning, methodology, and student advising. It is not necessary for an entire course to be devoted to each of these topics. A series of seminars could adequately serve this function.

The internship component of the D.A. program is similarly problematical. For example, what if the students are experienced teachers? And what about payment for their services? The question of research appropriate for the D.A. degree is answered easily enough. Such research should be aimed at advancement of knowledge about the teaching of the discipline rather than the discipline itself. That we don't know a great deal about the learning process is the reason why it is a suitable subject of inquiry.

The D.A. degree has a relatively brief history. In 1966, Carnegie-Mellon University became the first to enroll a D.A. student. Working towards the objective of initiating major changes in higher education, the Carnegie Commission recommended the D.A. degree in 1970 and disbursed 13 or 14 planning grants to a variety of schools. Many of these have been able to expand even though the financial crunch presented a problem at a critical period.

Dr. E. Alden Dunham (continued)

As regards the present status of the degree, the yearly reports compiled by Robert Koenker of Ball State University provide the best index of progress. According to Koenker's latest report, published in March of 1976, 25 universities presently offer the degree, 4 are planning to offer it and 33 are considering offering it. A total of 416 degrees have been awarded thus far and current enrollment stands at 556 students in 25 institutions. Koenker also considered the question of placement and was able to report that upwards of 90% of the graduates either returned to their former institutions or obtained new positions.

There are a few problems facing further development of the degree. First among these is the notion that the D.A. is "second-class." If anything, many D.A. programs are more rigorous than Ph.D. programs in order to counter such criticism. More importantly, the D.A. serves a different function, so comparisons of quality with the Ph.D. have little meaning. Traditional faculty conservatism also presents a problem but this is endemic throughout higher education. Those problems which have limited and inhibited the growth of D.A. programs include the financial crunch, the general oversupply of Ph.D.'s (although this varies by discipline) and the fact that fewer graduates will be hired by academia over the next few years. This last problem may be offset by looking outward for alternative means of employment for graduates, by viewing the D.A. as a generic degree for applied programs in extra-academic areas.

Concerning the future of the D.A. degree, it is useful to note recent actions by the New York State Board of Regents, a very powerful group. As a result of a recent study, which found that Ph.D. programs were preparing researchers rather than teachers, the Regents recommended the discontinuation of some Ph.D. programs. They further found a great need for in-service training of teachers. The D.A. degree represents one means of upgrading current faculty. The Board of Regents have funds to investigate the D.A. as a substitute for existing programs and could establish a trend for transforming Ph.D. programs to D.A. programs with no increase in cost.

SUMMARY OF SPEECH BY DR. PAUL L. DRESSEL

There are five major components of Doctor of Arts degree programs: content courses, professional courses, internship, examinations, and the final project or thesis. The first of these, content courses within the discipline, may include work in a related area outside the major and should be broadly based yet have some depth. However, including broadly-based work may lead to an excessive number of course requirements with the result that the degree becomes priced out of the market because of the time required for completion of necessary work. In addition, the content component of the degree should be oriented towards teaching at the undergraduate level.

Currently, we have the anomalous situation of Ph.D.'s training D.A.'s. It is necessary for a Ph.D. to rethink graduate training in terms of the way courses are taught and how they are evaluated. A Ph.D. engaged in training D.A. students should focus on the differences a graduate course will effect upon subsequent undergraduate instruction. Advanced courses should make a difference in undergraduate teaching. They should help one to teach undergraduate courses in a more meaningful way, should provide new insights for teaching at the undergraduate level. For example, professors should stop and ask D.A. candidates, "What difference does this make to undergraduate teaching--does this concept help to better explain a related but lower-level concept?"

Similarly, the professional component of Doctor of Arts degree programs should be concerned with the orientation of content courses toward undergraduate teaching. There is a strong argument here for the major discipline's accepting responsibility for professional courses, rather than delegating this responsibility to existing Education departments. This component should also be concerned with the technology available to teachers, the psychology of learning and the history of higher education in the United States. It is not necessary to devote a full course to these matters; a series of seminars aimed at introducing the literature might be sufficient.

The third component is labelled internship and refers to a supervised teaching experience within the department offering the degree. Externships have not been successful for several reasons. They are hard to identify and present problems for the student who must relocate. Generally, arrangements are not made far enough in advance to enable the extern to plan well and to receive pay for his services. In addition, students often adjust too readily to local values rather than attempting innovations, an exception being the case where the supervising teaching is innovative. The internship should not be waived for experienced teachers because the idea is to provide

Dr. P. L. Dressel (continued)

an opportunity for applying and evaluating newly learned techniques and methods.

The fourth component, examinations, is problematic. Generally, students have to spend too much time on these and too many exams are required. Standards for the degree should be upheld, but exams can break up the continuity of a program. Exams should be cumulative and integrative in nature and therefore have evaluative aspects as well. They should consist of meaningful tasks which when executed at all are symptomatic of progress and success, thereby requiring no grade.

The fifth component is a significant piece of work such as a dissertation or a research project and paper that should be inter-related with other components. Experience in research methodology is necessary for understanding of a discipline. It will also help in terms of general knowledge of tools and directing undergraduate research. Without such a final piece of work the D.A. becomes an A.B.D. (All But Dissertation) and therefore suffers in comparison with the Ph.D. degree. This component of the program often degenerates simply to an oral seminar presentation with the result that the D.A. becomes a consolation degree. One example of a worthwhile research project for a D.A. candidate would be a cumulative report on one's understanding of a problem area. It could include a discussion of how that understanding was affected by courses, what plans were for the internship in relation to this are, how the plans were executed and how to improve presentation of this area the next time it is taught.

It is unfortunate that there is a proliferation of doctoral degrees. The Ph.D. degree, although highly regarded, is unsuccessful in that few degree recipients do what the degree trains them for, namely research. A separate degree, designed for training teachers, is therefore presented as a practical alternative to other doctoral degrees. However, based on an evaluation of eighteen programs, the major problem with the D.A. degree is coherence and unity because the five major components tend to become isolated from one another. In developing a preliminary model of an ideal program, the primary goal is integration of all these components. The D. A. degree will not be viewed as vital unless this interrelation can be achieved. No department should consider offering the D.A. degree unless the discipline involved is viewed as a mode of thinking and inquiry rather than as a body of facts. This is important since the objective is to develop teachers with mastery in communicating the substance to students who, for the most part, are not interested in further study of the discipline. In addition, no department should offer this degree unless there are several superior undergraduate courses, particularly in the freshman and sophomore years. Each and every course required of D.A. candidates should be examined in relation to its potential improvement of teaching. Graduate courses should be the model but should provide insights applicable at the undergraduate level. Also, a mechanism should be provided for candidates to critically review their teaching/internship experience and improve upon perceived inadequacies.

SUMMARY OF FOUR YEAR COLLEGE SESSIONS

Session I

Immediately following Dr. Dunham's speech several persons were eager to question the purpose and concerns of the D.A. degree: Is it a watered-down Ph.D? Why doesn't a reputable university such as A.U. offer the traditional Ph.D.? Does the degree have credibility? What about the employability of holders of the degree? It was obvious that many participants had little knowledge of the D.A. programs available in several institutions.

After a vigorous discussion, it became apparent that the purposes and objectives of the D.A. degree were at least partially accepted. It was emphatically reiterated that the D.A. program parallels other doctoral programs but is oriented toward developing competence in a broad subject matter area.

Session II

The conferees unanimously expressed concern regarding the apparent lack of a research requirement for the D.A. degree. Many expressed the belief that research supplements good teaching. Furthermore, many believed that the D.A. program was devoid of a research requirement. However, the research M.S. degree in chemistry is a prerequisite for entering the D.A. program. Secondly, there are various options from which one may choose to fulfill the dissertation requirement for the D.A. degree. These options include traditional chemistry research, inter-disciplinary research, preparation of materials for teaching, comprehensive literature reviews and combinations of these.

It was suggested that nine instead of 6 hours of credit be awarded for the D.A. dissertation and that such would add credibility to the degree. This suggestion has been implemented.

Session III

During this final session two issues were raised: (1) the need for the "education-teaching component" and (2) the need to prepare D.A. students to teach "general physical science."

After much discussion it was agreed that the Education-Teaching component was necessary to fulfill the purpose of the D.A. degree; i.e., the production of scientists who will be effective teachers. Additionally, a well-structured course that will prepare D.A. students to teach general physical science is now required of candidates. It is a non-traditional physics course titled "Advanced Survey of the Physical Sciences."

Summary of Four Year College Sessions (continued)

Finally, it was recommended that the improvement of teaching be considered as a suitable topic for research by D.A. candidates. In the future we envision cooperation with department or schools of education in the Atlanta area to accomplish this recommendation.

Summary

The recommendations, broadly stated, are as follows:

1. The credibility of the D.A. degree must be carefully scrutinized.
2. The degree should not degenerate into a watered-down Ph.D.
3. Research must be an intimate phase of the D.A. degree program.
4. The Education-Teaching component should not consist exclusively of traditional education courses.
5. The internship and future employment possibilities should be related whenever possible.
6. More credit (9 hours) should be assigned to the dissertation.
7. Research and teaching should be conducted in the cognitive and affective domains.
8. A department should not offer the D.A. degree unless three or four undergraduate courses are available to serve as models where effective teaching is currently being accomplished.

SUMMARY OF JUNIOR AND COMMUNITY COLLEGE SESSIONS

Session I

There are conflicting pressures with regard to community college faculty moving toward degrees beyond the master's. Pressure to move toward higher degrees, with the possibility of this being reflected in policy in some states, was reported. The colleges want to get more benefit, however, than an additional degree conceived of as hurdle or just another title. In those colleges where salary and rank are tied to degrees, acquisition of higher degrees is tied to the question of economics. Where unionization has occurred, there is often an uncoupling of salary and rank and degree.

Where a community college largely draws students who would not go to college if the community college were not there, there is a clear need for faculty who will counsel students, who will recruit students, and who can deal with inadequate math and science backgrounds. This is especially necessary if the numbers of these students who will continue their work in science is to increase. At present, the number who continue in science is very small, one example being Kennedy-King College in Chicago where out of a student body of some 10,000, only about 20 students take organic chemistry.

Session II

The chemistry curriculum in community colleges is tremendously varied out of an emphases on special career-related courses which comprise about half of the chemistry courses taught. The career-related courses include allied health, general and organic chemistry, instrumentation for clinical lab technicians, engineering chemistry, textile chemistry, fire and police science, and nursing chemistry. Organic chemistry has largely replaced qualitative and quantitative analysis as the second year course for transfer students. A basic chemistry course for non-transfer students is generally the course which attracts the most students.

Computer-assisted instruction, audio-tutorial units, slide-tape units, video tapes of labs, programmed material, movies and other auxiliary aids appear to be in frequent and general use. Although these aids usually require large amounts of time to produce, they are frequently developed in-house, with or without the aid of media specialists.

Students frequently lack adequate counseling as to job or career opportunities which require a science or chemistry background, and as to the appropriate academic program. The counseling staff at many community colleges does not have the time or special knowledge to provide the best help in this area.

Summary of Junior and Community College Sessions (continued)

Session III

There is a need for 2- to 3-day workshops on topics of special interest or usefulness for community college staff such as industry-related chemistry, how to write a journal article, etc. The two-year college chemistry section of the American Chemical Society has been and is one major vehicle for such workshops.

There are numerous possibilities for creative work related to the teaching of chemistry in community colleges. A partial listing includes: research on and development of new career-related programs, research on the basic deficiencies of inadequately prepared students and how best to deal with these deficiencies, designing new experiments, analysis of the major problems of a given chemistry department, development of diagnostic tests, development of techniques for presenting science to administrators and legislators, development of low cost instrumentation, development of alternatives to labs, development of ways to increase the number of minorities and women in chemistry, development of methods to organize and update a community college chemistry library. In addition, basic data is needed on such questions as: types of programs in community colleges, types of people teaching in community colleges, needs for new career- or industrial-related programs, program costs, the structure of current chem. tech. programs.

The needs of a current community college teacher who enters a D.A. program will be different from those of other students in such areas as the time-sequencing of the program, and the nature and location of the internship.

Summary

The need for a D.A. program was not a primary topic in the community college sessions. While recognizing that the D.A. degree will take time to prove its particular value, several participants felt that the thrust of the degree was in the direction doctoral programs should be headed from the standpoint of undergraduate education.

Points or issues raised which need to be considered in structuring the D.A. program at Atlanta University are: (a) giving real attention to the structuring of the time sequence so that it will meet the needs of a person who is currently teaching in a community college, (b) giving attention to the importance of career-related programs in community college offerings and the connection to industrial chemistry, (c) providing training that reaches out to biology, physical science, and premedical fields, (d) providing students with the background and skills needed for knowledgeable and effective academic and career counseling in chemistry, and (e) realizing that there is a fertile ground for collaboration and cooperation between a graduate department with a D.A. program and the two year college chemistry world.

APPENDICES

CONFERENCE PARTICIPANTS

Ms. Clara I. Adams, Morgan State University

Dr. Benjamin H. Alexander, Chicago State University

Dr. Taylor Barbee, Shelby State Community College

Mr. Douglas J. Bauer, Mohawk Valley Community College

Dr. Gladys Bayse, Spelman College

Dr. Huey E. Charlton, Atlanta University

Dr. William E. Cheek, Central Piedmont Community College

Dr. Wilbur E. Clarke, Southern University

Dr. Woodrow Dorsey, Talladega College

Dr. Paul L. Dressel, Michigan State University

Dr. E. Alden Dunham, Carnegie Corporation of New York

Dr. Cecil N. Hammonds, Penn Valley Community College

Dr. Astor Y. Herrell, Knoxville College

Dr. Matthew Howard, Jr., Lawson State Community College

Dr. Jesse W. Jones, Bishop College

Dr. James T. Kinard, Benedict College

Dr. Ethelreda Laughlin, Cuyahoga Community College

Dr. Tom Maier, Atlanta Junior College

Dr. Henry D. McBay, Morehouse College

Mr. Daniel Miller, Forest Park Community College

Dr. McDougald Monroe, Atlanta Junior College

Dr. William E. Moore, Institute for Services to Education

Dr. W. D. Moorehead, Fort Valley State College

Conference Participants (continued)

Dr. James Perkins, Jackson State University

Mr. Burton Robin, Kennedy-King College

Dr. George E. Rolle, Southern Association of Colleges and Schools

Dr. Alfred S. Spriggs, Clark College

Dr. Huey M. Rowe-Anderson, Johnson C. Smith University

Dr. Billy C. Black, Albany State College

Atlanta University Chemistry Faculty:

Dr. Kofi B. Bota

Dr. Thomas W. Cole, Jr.

Dr. Frank E. Cummings

Dr. Joe Johnson, Jr.

Dr. G. Scott Owen

Dr. Malcolm B. Polk

Dr. James L. Reed

Dr. Alfred F. Young

Atlanta University Doctor of Arts Students:

Mr. Leroy Combs

Mrs. Cornelia Gillyard

QUESTIONS FOR FOUR YEAR COLLEGE PARTICIPANTS

1. Is there a need for better training of college teachers?

2. What are some of the bases for student pressures for better teaching at the college level?

3. What factors other than basic grounding in subject matter area are important for effective teaching?

4. How much significance should be given to teaching methodology, learning principles, student differences, the service roles of some disciplines, the relations among disciplines and the subsidiary role of a discipline in attaining a liberal education?

5. What specific training in science and mathematics would be most useful for a prospective college chemistry teacher in terms of content, breadth, and emphasis?

6. What teaching skills would a person need to be a successful college teacher of chemistry?

7. Would your institution accept a D.A. degree candidate to experience his/her internship in your department of chemsitry? How would the internship be structured and what would be the relation between the two institutions?

8. If you were to initiate a faculty development program in your department, what would be the focus of the activity?

QUESTIONS FOR JUNIOR COLLEGE AND COMMUNITY COLLEGE PARTICIPANTS

Aims and Characteristics of the community college program, faculty, and students.

1. What are the aims of your program? What does it consist of? Where is its emphasis?
2. What are the aims of your students? How many go further in chemistry? What are the goals of the part-time students? What is their attitude?
3. Where is your time spent?
4. How multidisciplinary is your program?
5. What are the major pluses and the major problems?

Content of a Doctor of Arts Program.

1. What should be in a D.A. program for prospective community college teachers?
2. How much and what type of emphasis should be placed in the following areas: chemistry, math, other sciences, counseling skills, teaching-learning theory, materials development?
3. What piece of creative work should be used in place of a traditional Ph.D. research thesis?

Internships and other functions for a D.A. program.

1. How would you handle an internship phase of the program?
2. How do you stay current in chemistry, in teaching ideas and skills?
3. What materials, areas, modules need developing?
4. What research is needed or would be useful?
5. How in general could a department which offers the D.A. help community college chemistry programs and staff?

LISTING OF MATERIALS PRE-SENT TO PARTICIPANTS

1. "Community College Teacher Preparation, A Brief prepared for the Conference on the Doctor of Arts sponsored by Atlanta University," ERIC Clearinghouse for Junior Colleges, University of California Los Angeles, 1976.

2. "Status of the Doctor of Arts Degree," Robert H. Koenker, Ball State University, Muncie, Indiana, 1976.

3. "Doctor of Arts Degree," H. Guyford Stever, Science, 170, 587 (1970).

4. "R_x for Higher Education: The Doctor of Arts Degree," E. Alden Dunham, Journal of Higher Education, 41, 505 (1970).

D.A. DEGREE IN CHEMISTRY -- PROGRAM DESCRIPTION

The Doctor of Arts Degree

The Doctor of Arts (D.A.) Program in Chemistry at Atlanta University, begun in the fall of 1975, is designed to afford an alternative to the traditional Ph.D. degree for potential college teachers. It is directed toward training community and junior college teachers and science division heads, chemistry teachers in small liberal arts colleges, and science coordinators in large public school systems with an emphasis on teaching in institutions with sizeable minority group student populations. The D.A. Program parallels other doctorate programs but is oriented toward developing teaching competence in a broad subject matter area.

Program of Study

D.A. candidates must complete a minimum of 75 semester hours. Of these 75 hours, 30 are chemistry courses, 18 are Education courses (including 9 hours credit for the internship phase) and 15 hours are research credit. At least 48 semester hours of the required total must be earned at Atlanta University. Various options are available for completion of the dissertation requirement. All D.A. candidates must serve at least one year as a teaching assistant in one of the undergraduate institutions in the Atlanta University Center. In addition, students must participate in the internship phase of the program, a progression of varied activities which build sequentially and culminate in the student's having major responsibility for one course. The internship phase will be arranged through a member institution in the Atlanta University Center, a community college in the Atlanta area, or another regional liberal arts or community college.

The Department

In 1976, there were thirty-five students enrolled in the Chemistry Department and a faculty of eight professors. There are eight additional persons with Ph.D.'s from the faculties of other schools in the Atlanta University Center who teach courses or direct research on a part-time basis. With this low student-faculty ratio, considerable personal attention is accorded to every student. Nearly all students are provided with financial support during the academic year and summers. Student support in the D.A. Program is at least $350/month plus tuition and fees. Research facilities in the department are extensive and include access to instrumentation at other schools in the Atlanta University Center as well as other colleges in the Atlanta area. The D.A. Program maintains a Media Materials/Reading Room with holdings in chemistry and chemical education. Semi-annual conferences are held on campus whose focus is chemical education in the junior and small four-year college.

Program Description (continued)

The University

Atlanta University is the graduate and professional school component of the Atlanta University Center, which also includes Clark, Morehouse, Morris Brown and Spelman Colleges, and the Interdenominational Theological Center. The University Center, with a total enrollment approaching 8,000, is one of the foremost black educational complexes in the nation and a focal point of black thought and art. Atlanta University is located approximately one mile from downtown Atlanta.

Curriculum

		Hours
Chemistry courses --	Adv. Organic Chemistry I and II	6
	Adv. Inorganic Chemistry	3
	Physical Inorganic Chemistry	3
	Adv. Physical Chemistry	3
	Molecular Structure	3
	Instrumental Analysis	3
	Adv. Biochemistry I	3
	Research in Chemistry for M.S. Degree	6
Electives in Chemistry, Biology		33
Mathematics or Computer Science		12
		42 hours

Education-Teaching component --

The education-teaching component is designed with three thoughts in mind: (1) the specific objective of the D.A. program is to develop the teaching capabilities of the student, (2) this component should involve a progression of varied activities which build sequentially on each other, and (3) the program should address the question of minority group higher education, though not exclusively.

Tools for Teaching	3
Higher Education in the United States	3
History, Philosophy, & Sociology of Science	3
Prelude to Internship	3
Internship I	3
Internship II	3
	18
Electives (non-science)	6
Dissertation Research	9
	75 hours total